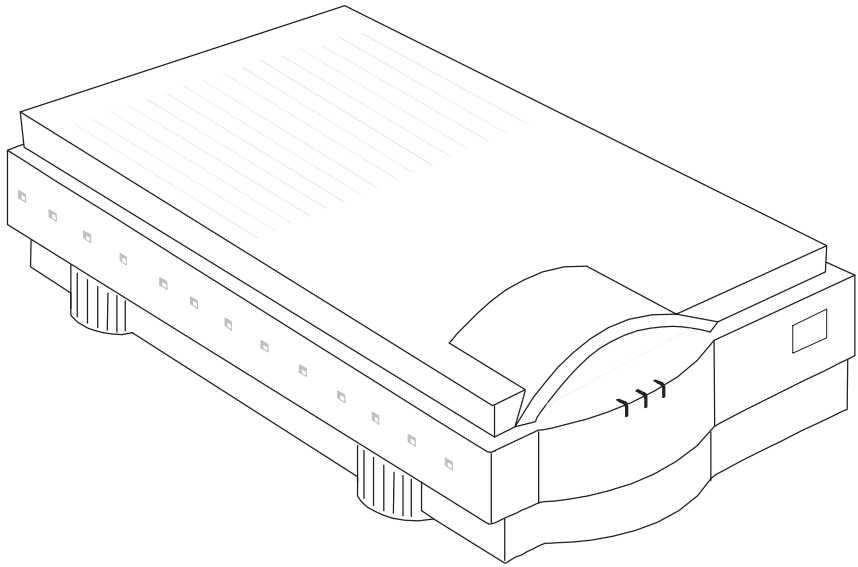
QMS® CrownCopy™ User's Guide



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1

Installing CrownCopy

In this Chapter...

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- “Printer System Requirements” on page 3
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About CrownCopy

The QMS CrownCopy option doubles the functionality of the QMS *magicolor* printer, allowing it to be a color copier as well as a printer. You also have the flexibility to use CrownCopy as a scanner attached to a computer, if you install the scanning host software (that comes in the box with the scanner) on your system.

CrownCopy gives you the ability to make vivid color copies at an affordable cost.

Media Change Notice

Some of the procedures throughout this documentation may refer to applications, utilities, and/or print drivers being located on disks, but recently QMS has begun placing these on CD-ROM.

» **Note:** *If you need alternate media, please contact your QMS vendor for media availability and purchase information. You can also download some of these files via ftp from our World Wide Web Server at http://www.qms.com, our Bulletin Board at (334) 633-3632, or CompuServe at go qmsprint. See the "QMS Customer Support" section of your QMS printer documentation, for sales and support locations and telephone numbers.*

Printer System Requirements

To use CrownCopy, you must have the following installed in your printer:

- An internal IDE hard disk—80 MB or larger
- At least 32 MB RAM; however, QMS recommends 40 MB RAM to obtain the fastest copying speeds

Additional RAM and hard disk space above the minimum decrease copying times, especially of large images. For information on your printer's current hard disk and RAM status, print a status page (Administration/Special Pages/Print Status menu). Contact your QMS vendor for information on purchasing a hard disk or additional RAM. See the "Printer Options" chapter of your printer documentation for information on installing these options.

Unpacking CrownCopy

If you purchased the complete CrownCopy option, the scanner kit and the software option kit come in the same box. If you purchased the scanner separately, then the software option kit comes in a separate box.

» **Note:** *The CrownCopy option supports version 1.5 of the UMAX Vista S6E scanner. The version number is on the back of the scanner box.*

The scanner kit contains the following:

- Scanner
- Power cords (Both 110- and 220-volt cords are supplied. 100-volt cords are supplied in Japan only)
- SCSI terminator and SCSI cable

You also received additional items that allow you the flexibility to use CrownCopy as a scanner attached to a computer (but are **not** required to use CrownCopy as a copier):

- Scanning software
- Calibration software
- SCSI interface daughterboard

See the documentation accompanying these items for information on setting up CrownCopy to scan images to a host computer.

» **Note:** *CrownCopy cannot be connected to both a printer and a computer at the same time. It can be connected either to the printer or to a host computer.*

The CrownCopy software option kit contains this manual and the following:

- Warranty card
- Registration card
- *magicolor* LX envelope containing CrownCopy software (on disks) for the QMS *magicolor* LX printer, a Select/Copy key overlay, and a PROM

- *magicolor* CX envelope containing CrownCopy software (on disks) for the QMS *magicolor* CX

Installing CrownCopy

» **Note:** *Before installing CrownCopy on your printer, you should turn on the printer, wait for* `IDLE` *to appear in the message window, and then print an advanced status page. (See "The Status Pages" section of your printer user's guide for advanced status page information.)*

This procedure should not change your printer's configuration settings. However, the advanced status page provides a record of all current configuration settings, so you can verify that they are the same or recover your settings after installing CrownCopy.

1 If you have a *magicolor* CX, skip to step 3.

2 If you have a *magicolor* LX, place the Select/Copy overlay on the printer's Select key, then update the printer firmware.

This firmware (a PROM) is provided with the CrownCopy kit. For installation instructions, see "Updating the Printer Firmware" on page 10 of this chapter.

3 If you added memory in the printer, place the additional memory in the printer's Emulation memory buffer so CrownCopy can use it.

Printer Resolution (dpi)	Printer RAM (MB)	Emulation Buffer Size (KB)
300	24	852
600	24	1024
	32	4096
	40	10240
	64	27648

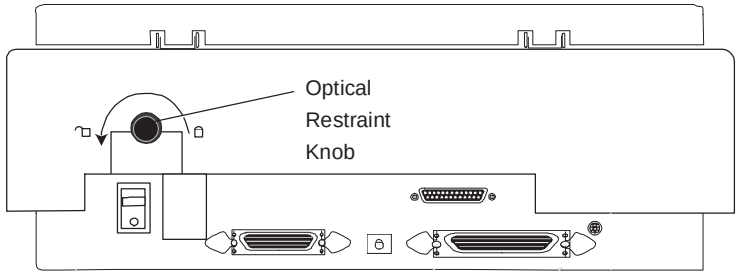
The Emulation buffer is accessed through the printer's control panel in the Administration/Memory/K Mem Emulation submenu.

The printer documentation contains information on using the control panel.

» **Note:** *If you allocate too much or if you don't have enough Emulation client memory, an* `INCORRECT VALUE` *message appears in the printer message window and the printer resets to the previous memory value for Emulation.*

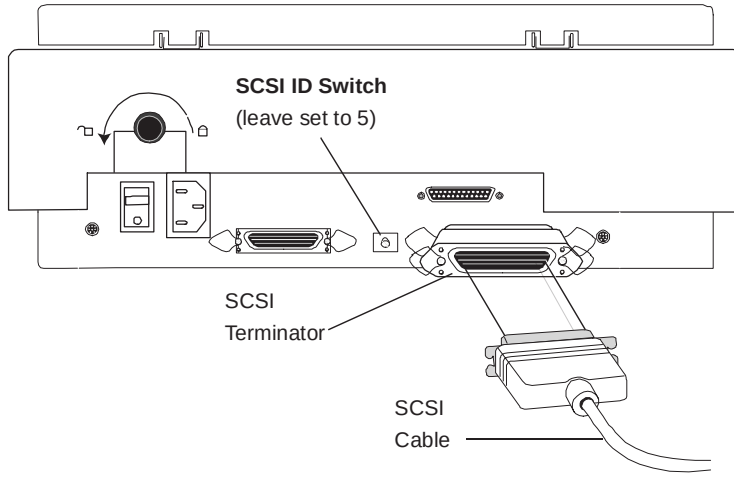
4 Unlock the scanner's optical assembly.

Press and turn the optical restraint knob to the left.



▲ ***Caution:*** *To avoid scanner damage, relock the optical restraint knob whenever you move the scanner. This knob locks down the scanner roller assembly, so that when you move the scanner it won't flop around and break something.*

5 Attach the SCSI terminator and the SCSI cable to the scanner.



6 Turn off the printer.

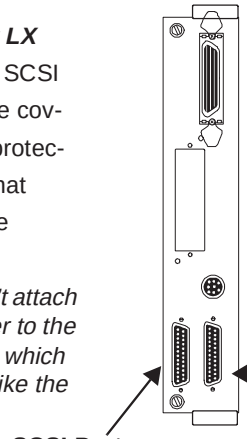
7 Attach the other end of the SCSI cable to the printer.

Different versions of the *magicolor* printer have different interface panels.

***magicolor* LX**

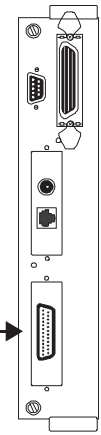
On the ***magicolor LX*** printer, the SCSI port may be covered by a protective plate that needs to be removed.

» **Note:** *Don't attach the scanner to the serial port, which looks just like the SCSI port.*



***magicolor* CX**

On the ***magicolor CX*** printer, the SCSI port is at the bottom of the interface panel.



» **Note:** *Do not attach the scanner here.*

8 Use the appropriate power cord to attach the scanner to a power source.

9 Turn on the scanner, wait 5 seconds, and then turn on the printer.

» **Note:** *If you connect the scanner (to the printer) and turn it on and wait either less than 3 or more than 20 seconds before turning on the printer, then after the printer system software is updated a* `NOT CONNECTED RECONNECT?` *error message displays on the printer control panel. Press the Copy/Select key, select Yes, and the scanner will be automatically reconnected.*

This new system software provides enhanced CrownCopy color features for the scanner. It is provided in both PC and Macintosh format. Refer to the instructions in the “Printer Options” chapter of your printer documentation for complete instructions on updating the system software.

10 Check the startup page to see if a `scanner connected` message appears in the Interface section next to SCSI.

If `scanner connected` appears next to SCSI, continue at step 11. If `scanner not connected` appears, press the Copy/Select key on the control panel, and then select Yes. The scanner is reconnected. (See “Troubleshooting the Scanner” in chapter 2, “Using CrownCopy,” for additional problem resolution information.)

11 Print another advanced status page, and verify that the configuration settings are the same as when you started this procedure.

12 CrownCopy is ready to use. See “Making Copies” on page 3 of chapter 2 for copying instructions.

- For information on adjusting copy settings, see “CrownCopy Settings” on page 6 of chapter 2.
- For information on options, see “The ADF Option” on page 2 or “The Transparency Adapter Option” on page 14 of chapter 3.

Updating the Printer Firmware

» **Note:** *This procedure is necessary **only** if you're using a QMS magicolor **LX**. It is **not** necessary for a QMS magicolor **CX**.*

▲ ***Caution:** Due to the technical nature of this procedure, QMS recommends that you have it performed by a QMS-authorized technician. These instructions are provided for a person experienced in working with circuit boards, such as a system administrator, but they must be followed carefully to avoid damage to the printer. QMS reserves the right to charge for repairs necessitated by improper installation. For QMS-authorized installation, contact your QMS vendor. If your QMS vendor does not provide service, contact QMS to arrange service. See appendix A, "QMS Customer Support," for information on contacting us.*

Important Note for EtherTalk Users

If your printer has an EtherTalk daughterboard installed (a non-CrownNet network interface, version 1.91 or earlier), the first time the printer boots up after you upgrade your printer system firmware, EtherTalk mode will be disabled. Go into the printer's configuration menu (Administration/Communications/EtherTalk/Mode) and select Enabled.

▲ **Caution:** *Incidental and consequential damages caused by not discharging electrostatic buildup can affect your printer warranty, so it's very important to protect the printer controller board from electrostatic damage while performing this upgrade.*

***If you have an anti-static wrist strap,** attach one end of it to your wrist and the other end to any convenient electrical ground (for example, the bare metal chassis of equipment, as on the back of a computer, that is plugged in but turned off). Never attach the wrist strap to any piece of equipment with an electrical current present. Turn off all power switches first. Plastic, rubber, wood, painted metal*

surfaces, and telephones are not acceptable grounding points. The printer isn't an acceptable grounding point either because it must be unplugged before you perform this task.

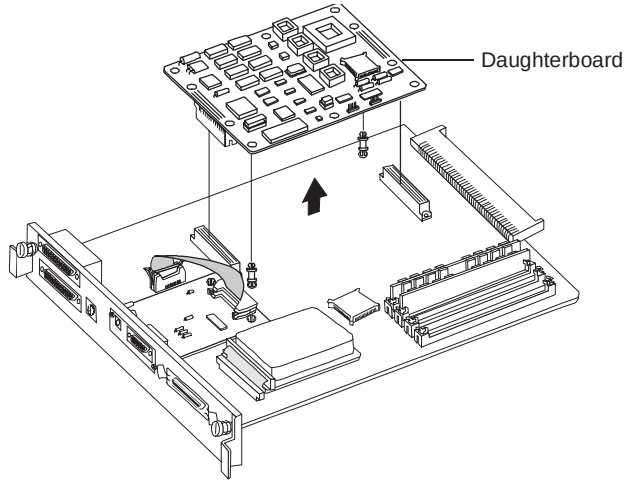
If you don't have an anti-static wrist strap, *discharge your body's static electric charge by touching a grounded surface before you handle any printer boards or components and before removing the tray assembly cover. Redischarge your body each time after walking around and before touching the printer tray assembly again. Handle the tray carefully, and try to handle it by the edges only.*

---

1 Remove the printer controller board.

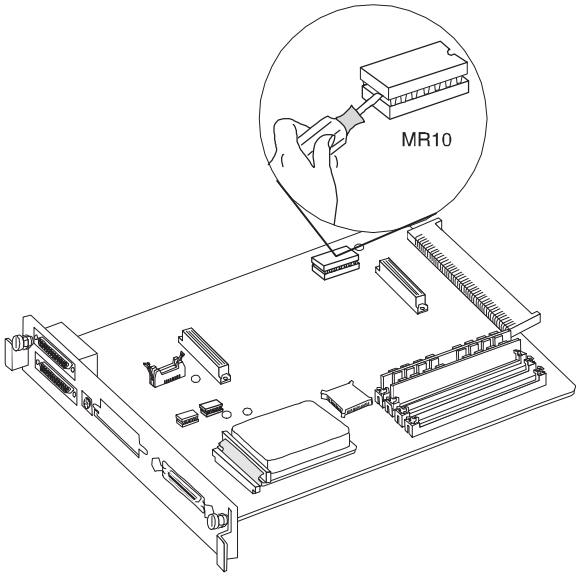
Instructions are in the section called “Removing the Controller Board” in the Options chapter of your printer documentation.

2 If the controller board has no daughterboard installed, skip to step 3. If the controller board does have a daughterboard installed, detach it from its connectors and support posts and put it aside.



Magicolor LX

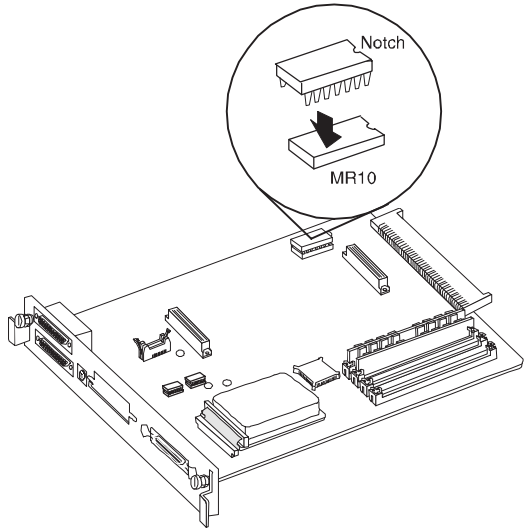
3 Use a flat-tipped screwdriver to remove the PROM from the MR10 socket.



Magicolor LX

4 Line up the notch on the new PROM with the notch on the MR10 socket. Carefully insert the PROM's pins in the socket.

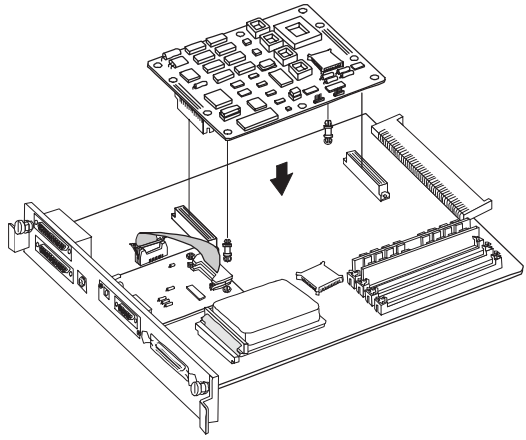
▲ **CAUTION**: *If the PROM is installed backwards, it will be destroyed when the printer is turned on. Also, make sure all of the PROM pins get inserted into the socket and that none of them get bent underneath the PROM.*



Magicolor LX

5 If you didn't remove a daughterboard earlier, skip to step 6. Otherwise reattach the daughterboard to its support posts and connectors.

The daughterboard is keyed so that it fits only one way.



Magicolor LX

6 If you have RAM SIMMS to install, this is a good time to install them.

The Options chapter of your printer documentation explains how to install RAM SIMMs.

7 Make sure no components on the board—especially the SIMMs—shifted or loosened during the procedure.

8 Replace the printer controller board.

Follow the instructions in the section called “Replacing the Controller Board” in the Options chapter of your printer documentation.

9 If the printer boots up normally (`IDLE` appears in the message window), return to step 3 on page 5 to finish installing CrownCopy.

If the printer isn't operating properly when it's turned on, make sure that the controller board is firmly seated in its connectors, that no pins are bent between the new PROM and its socket, and that the PROM is installed in the right direction.

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2

Using CrownCopy

In this Chapter...

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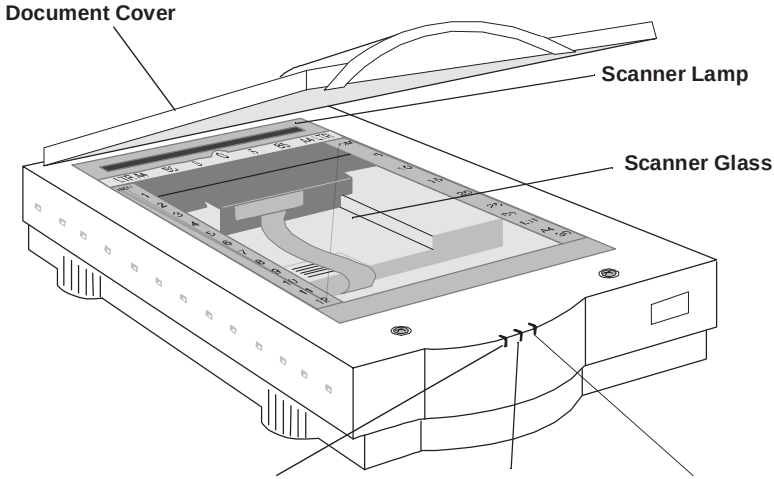
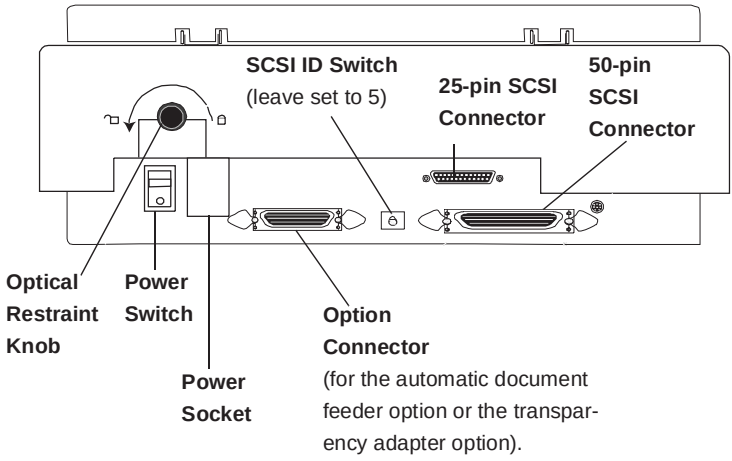
- “Making Copies” on page 3
- “The CrownCopy Menu” on page 5
- “CrownCopy Settings” on page 6
- “Troubleshooting the Scanner” on page 14
- “Scanner Technical Specifications” on page 20
- “Memory, Resolution, and Average Scan Times” on page 21

Scanner Overview

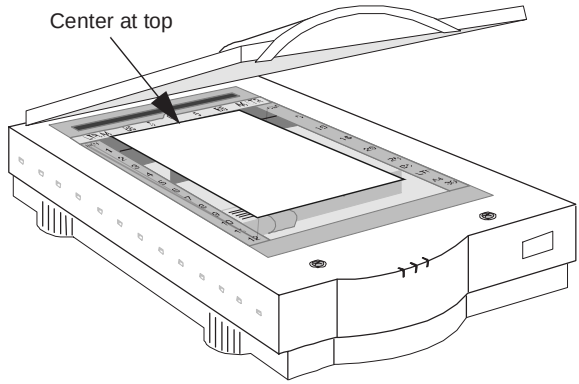




Making Copies

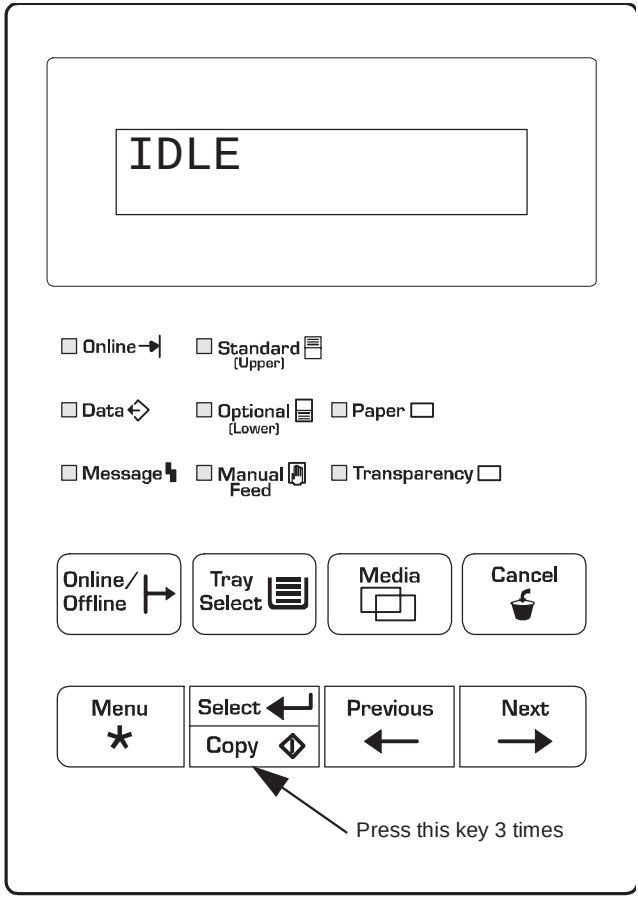
1 **Turn on the scanner, wait 5 seconds, and then turn on the printer.**

2 **Put a document face-down centered at the top of the scanner glass; then close the cover.**



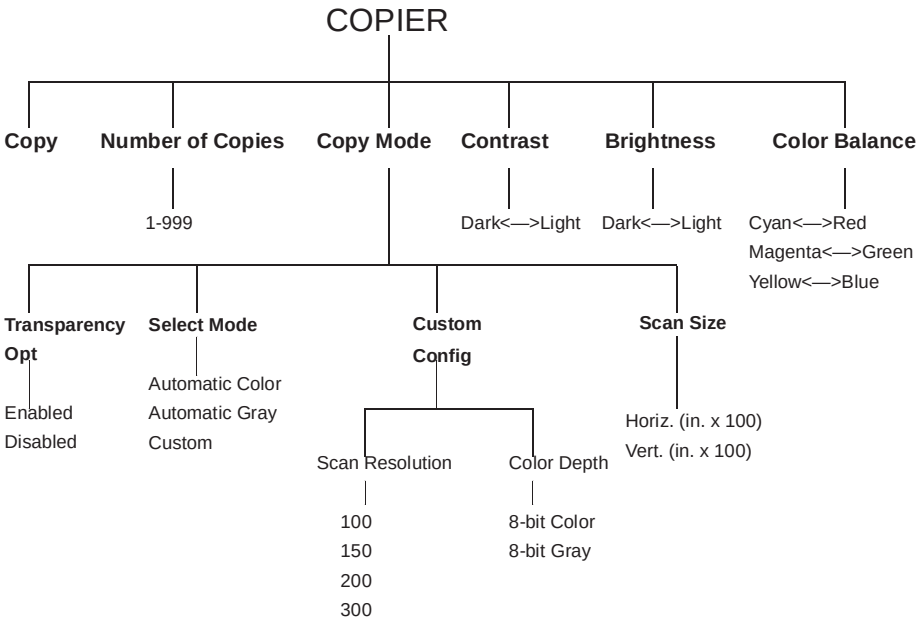
3 Make sure the printer's Online light is on and press the printer's Select/Copy key 3 times.

If the Online light is not on, press the Online/Offline key to bring the printer online.



The CrownCopy Menu

The options in this menu are explained in “CrownCopy Settings” on page 6. When the printer is on line and idle, press the Select/Copy key once to enter the Copier menu.



Making Changes to the CrownCopy Menu

To access the Copy menu, press the Select/Copy key once. Then use the Next or Previous key to scroll through the top level menus (Copy, Number of Copies, Copy Mode, Contrast, Brightness, and Color Balance). To enter a lower-level menu or select a menu option, press the Select/Copy key. Use the Menu key to exit from the menu and return to IDLE after you have made your selections.

» **Note:** *Copy menu changes stay in effect only for the next scan executed.*

CrownCopy Settings

Copy options are accessed through the printer's control panel. See "The CrownCopy Menu" on page 5 for a diagram of the Copy menu. See your *magicolor* printer documentation for detailed information about the configuration menu and the control panel.

▲ **Caution**: *Each configuration change you make affects the quality of your printed output significantly. Therefore, we recommend changing* ***only one setting*** *at a time, printing a test print, and then determining if further configuration changes are necessary.*

Copy

Menu	Copier/Copy
Purpose	Use this option to make a copy.
Choices	Copy Use this option to make a copy. When the printer is on line, press the Select/Copy key 3 times to make a copy.
Notes	See "Scan Resolution" on page 11 for information on increasing scan resolution.

Number of Copies

Menu	Copier/Number of Copies
Purpose	Use this option to set the number of copies you want.
Choices	1-999

Default	1
Notes	Each digit can be set individually: use the Select or Menu key to move the cursor to the digit you want to change, and then use the Next key to increase it or use the Previous key to decrease it. Once the number you want is set, press the Select key to save it. The number of copies is reset to 1 each time CrownCopy is used. When you're printing multiple copies, subsequent copies are printed faster than the first copy.

Contrast

Menu	Copier/Contrast
Purpose	Use this option to adjust contrast in copies.
Choices	15 contrast settings; each makes an incremental contrast change of about 2% D—Moving the setting in this direction increases contrast. It makes light areas appear lighter and dark areas appear darker. L—Moving the setting in this direction decreases contrast by making dark areas appear lighter and light areas appear darker.
Default	The middle setting
Notes	Use the Previous key to move the message-window cursor from the center towards the left to a darker (higher contrast) setting or use the Next key to move the cursor towards the right to a lighter (lower contrast) setting. Each increment of change in the contrast setting is significant in output quality. Therefore, we recommend that you change the setting by only one level, print out a test copy, and then determine if further modification to the contrast setting is necessary. See chapter 4, "Copy Quality" for more information on these options.

Brightness

Menu	Copier/Brightness
Purpose	Use this option to adjust brightness in copies.
Choices	15 brightness settings; each setting makes an incremental brightness change of about 2% D—Moving the setting in this direction decreases brightness. It darkens the overall image making light and dark areas appear darker. L—Moving the setting in this direction increases brightness. It lightens the overall image making light and dark areas appear lighter.
Default	The middle setting
Notes	Use the Previous key to move the message-window cursor from the center towards the left to a darker (less bright) setting or use the Next key to move the cursor towards the right to a lighter (brighter) setting. Each increment of change in the brightness setting is significant in output quality. Therefore, we recommend that you change the setting by only one level, print out a test copy, and then determine if further modification is necessary. See chapter 4, “Copy Quality” for more information on these options.

Color Balance

Menu	Copier/Color Balance
Purpose	Use this option to balance the color in copies.

Choices	3 color balance menus with 15 color settings for each menu; each color setting makes an incremental color balance change of about 2%. » **Note:** *Moving the setting away from the middle in the left or right direction increases the amount of color shown above the direction in which you're moving the setting. Conversely, moving the setting towards the middle from a left or right position decreases the amount of color. The middle position is an even balance of both colors. These settings operate the same as the brightness and contrast settings. (See chapter 5, the "Adjusting Contrast and Brightness" section, for a graphical image of how the brightness and contrast settings operate.)* Cyan-Red—Displays the cyan-red color settings. Magenta-Green—Displays the magenta-green color settings. Yellow-Blue—Displays the cyan-red color settings.
Default	Cyan-Red—middle position Magenta-Green—One setting to the right of the middle position Yellow-Blue—middle position
Notes	Use the Previous key to move the message-window cursor from the center to the left and use the Next key to move the message-window cursor to the right. Two colors are adjusted at a time: Increasing red has the effect of decreasing cyan in the copy output. Increasing green has the effect of decreasing magenta in the copy output. Increasing blue has the effect of decreasing yellow in the copy output.

Transparency Option

Menu	Copier/Copy Mode/Transparency Opt
Purpose	Use this option to specify how you want the Transparency Adapter (an optional accessory) to work.

Choices	Enabled or Disabled Enabled—Specifies transparency document copying. Enables the transparency adapter's backlighting feature, which optimizes transparency copying. See "The Transparency Adapter Option" on page 14 of chapter 3 for more information. » **Note:** *The Transparency Adapter option must be installed before you can enable this option.* Disabled—Specifies paper document copying. Turns off the transparency adapter's backlighting feature, which optimizes paper document copying.
Default	Disabled

Select Mode

Menu	Copier/Copy Mode/Select Mode
Purpose	Use this menu to specify what type copy is being made so the printer can optimize for this type output.
Choices	Automatic Color, Automatic Gray, Custom Automatic Color—Sets color depth to 8-bit color and scan resolution to 200 dpi. Use this option when copying color documents. Automatic Gray—Sets color depth to 8-bit gray and scan resolution to 200 dpi. Use this option when copying documents that are black and white or shades of gray. Custom—Allows you to set the color depth and scan resolution.
Default	Automatic Color
Note	In order to change the default color depth or scan resolution, you **must** choose the Custom option in this menu.

Scan Resolution

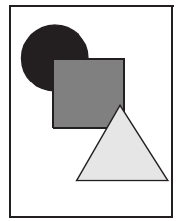
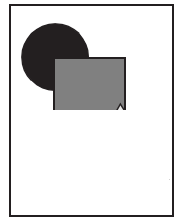
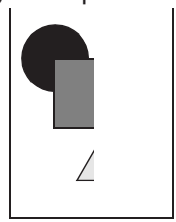
Menu	Copier/Copy Mode/Custom Config/Scan Resolution
Purpose	Use this menu to specify what resolution the scanner should use.
Choices	100, 150, 200, 300 100—Sets the scan resolution to 100 dpi. 150—Sets the scan resolution to 150 dpi. 200—Sets the scan resolution to 200 dpi. 300—Sets the scan resolution to 300 dpi. Choose a scan resolution that is at least half of the printer resolution being used. The higher the scan resolution, the more detailed the copy output (as long as the printer resolution being used is double the scan resolution). Also, a higher scan resolution increases copying time, because of the increased amount of data that must be scanned and sent to the printer for processing. (Each time scan resolution is doubled, the amount of information that is scanned and printed is quadrupled.)
Default	200 dpi
Note	In order to change the default scan resolution, you **must** choose the Custom option in the Copier/Copy Mode/ Select Mode menu.

Color Depth

Menu	Copier/Copy Mode/Custom Config/Color Depth
Purpose	Use this menu to specify how many colors or shades of gray are reproduced in copies.
Choices	8-bit color, 8-bit gray 8-bit color—Provides up to 16.8 million colors. This setting is slower than 8-bit gray because of the large amount of data that must be scanned and sent to the printer for processing. 8-bit gray—Provides up to 256 shades of gray for monochrome copies.
Default	8-bit color
Note	In order to change the default color depth, you **must** choose the Custom option in the Copier/Copy Mode/ Select Mode menu.

Scan Size

Menu	Copier/Copy Mode/Scan Size
Purpose	Use this menu to have the scanner scan only part of the scannable area in order to copy only part of an image or to reduce copying time for images smaller than letter or A4.
Choices	Horiz. (in x 100), Vert. (in x 100) Horiz. (in x 100)—Sets the width (horizontal size) of the copy. Vert. (in x 100)—Sets the length (vertical size) of the copy.

Default	Horiz. (in x 100) = 850; a width of 8.5 inches Vert. (in x 100) = 1100; a length of 11.00 inches
Note	The image is cropped from the right and bottom sides of the page (in other words, from the left and bottom of the scanner bed), so if you place this 8.5” x 11” image on the scanner bed  and crop it vertically by 400 you’ll get this:  If you crop it horizontally by 550 , you’ll get this:  The more you crop out of a scan, the less time it takes to process and print. For example, if you need to copy a photograph, you can get faster copies by placing it at the upper right corner of the scanner bed and cropping the scan to fit the dimensions of the photograph (the scanner bed has rulers that mark inches).

Troubleshooting the Scanner

Symptom	Solution
The scanner makes a grinding noise when you first turn it on.	■ Unlock the optical assembly. (See chapter 1, “Installing CrownCopy.”)
No copy is printed or SYSTEM ERROR (or another error message) appears in the printer control panel when the scanner is turned on or when the Copy option is selected.	■ Make sure the power cable is securely attached at both ends, that the printer and the scanner are both on, and that the electrical outlet they’re attached to has power. ■ Make sure the printer has paper and that the printer does not have a jam or other error. ■ If you have a *magicolor* LX, make sure the SCSI cable is connected to the scanner and to the printer’s SCSI port (not the serial port). ■ Make sure you attached the terminator to the scanner’s SCSI port before connecting the SCSI cable. (See chapter 1, “Installing CrownCopy.”) ■ Make sure the SCSI ID switch on the back of the scanner is set to 5. ■ Turn off the scanner and the printer. Then turn on the scanner first, wait 5 seconds, and turn on the printer. ■ Print an advanced Status Page and then restore printer defaults via the Administration/Miscellaneous/Restore Defaults menu. See the “Printer Configuration” chapter of your printer documentation for details. Use the advanced status page to reset any unique configuration settings.

- Make sure you correctly downloaded the CrownCopy software to the printer. (See chapter 1, “Installing CrownCopy.”)
- If you have a *magicolor* LX, you need to upgrade the printer firmware before the scanner can be used. See chapter 1, “Installing CrownCopy,” for instructions.
- See “Testing the Scanner” on page 19 and follow the instructions to verify the scanner is working correctly. If it is , the problem is on the printer side. See the printer user’s guide for troubleshooting information.
- Check that you have at least 24 MB RAM installed on the printer. This is the minimum RAM required to operate CrownCopy; however, QMS recommends 40 MB to obtain the fastest copying speeds.
- Check that the Administration/Memory/K Mem Emulation client has the required amount of memory to operate CrownCopy.

Resolution	RAM (MB)	K Mem Emulation
300	24	852
600	24	2048
	32	1024
	40	10240
	64	27648

If `NOT CONNECTED RECONNECT?` appears after you press the Copy/ Select key.	Check that the scanner is on and connected to the printer. If it is connected, then press the Copy/ Select key on the control panel, and select Yes. There are two choices for this error message: Yes and No. The default is No. No—Prompts this error message until you either press the Menu key to return to the previous menu or press the Online/Offline key to exit from the Configuration menu. Yes—Resets the controller, but not the print engine. So the configuration menu options remain changed. However, any active print jobs will be lost. If selecting this option doesn't clear the error, then check the following: 1 Check that the printer has an internal IDE hard disk (80 MB or larger), and that the SCSI ID on the back of the scanner is set to 5. (CrownCopy is supported via SCSI ID 5.) 2 Make sure you attached the terminator to the scanner's SCSI port before connecting the SCSI cable. (See chapter 1, "Installing CrownCopy.") 3 Check that the SCSI cable is connected correctly, especially if you have an LX, make sure the SCSI cable is in the SCSI port and not the serial port. 4 Turn the scanner off and back on again. 5 Check that `SCANNER CONNECTED` appears in the Interface section of the startup page. 6 After you've resolved the scanner problem by completing steps 1-5 above, select Yes and the scanner will reconnect. Otherwise, contact the QMS Customer Response Center. See appendix A, "QMS Customer Support," for contact information.

Edges of the copy are cut off	■ Make sure you're centering documents at the top of the scanner glass and that the scan size setting ("Scan Size" on page 12) is correct. Also, keep in mind that the printer's maximum imageable area is 8.11" x 10.61" for letter-size media and 200 mm x 287 mm for A4.
Image quality of copies is not optimal	■ Clean the scanner glass: dampen a lint-free cloth with alcohol or a mild detergent and wipe the glass clean. ■ If you're copying transparencies, you should purchase the optional transparency adapter, and make sure you've enabled the Transparency option in the printer's control panel. ■ If you're scanning at 150 dpi, some printed materials, such as magazines, cause moiré patterns. To remove these patterns, change the scan resolution to 200 or 300 dpi (choose Copier/Copy Mode/Select Mode/Custom and then Copier/Copy Mode/Custom Config/ Scan Resolution/200 or 300). ■ If copy colors are dramatically different from the colors in the original document, see chapter 4, "Copy Quality," for information on adjusting the appearance of copies. ■ Check the printer user's guide for additional troubleshooting tips for improving printout quality.

<table>
<tr>
<td>Images are taking too long to scan</td>
<td>

Check that you have at least 24 MB RAM installed on the printer. This is the minimum RAM required to operate CrownCopy; however, QMS recommends 40 MB to obtain the fastest copying speeds.
Check that the Administration/Memory/K Mem Emulation client has the required amount of memory to operate CrownCopy.

<table>
<tr><th>Resolution</th><th>RAM (MB)</th><th>K Mem Emulation</th></tr>
<tr><td>300</td><td>24</td><td>852</td></tr>
<tr><td>600</td><td>24</td><td>2048</td></tr>
<tr><td></td><td>32</td><td>1024</td></tr>
<tr><td></td><td>40</td><td>10240</td></tr>
<tr><td></td><td>64</td><td>27648</td></tr>
</table>
</td>
</tr>
<tr>
<td>The scanner lamp flickers, is dim, or fails to come on, or the scanner assembly stops in the middle of the scanner glass and doesn’t restart.</td>
<td>

The scanner lamp is failing or has failed and needs to be changed, or the bottom optional assembly cover may be loose.

WARNING! QMS recommends that any hardware maintenance on a non-functioning scanner be performed by a QMS-authorized service technician. QMS reserves the right to charge for repairs necessitated by improper maintenance. For QMS-authorized service, contact your QMS vendor. If your QMS vendor doesn’t provide service, contact QMS to arrange service. See appendix A, “QMS Customer Support,” for information on contacting us.
</td>
</tr>
</table>

Testing the Scanner

The scanner automatically performs a self-test each time it is turned on. To verify that the scanner is working correctly after it has been installed, turn on the power. If the following sequence of events occurs, the scanner is working:

1 **The Option, Ready, and Power LEDs flash once.**

2 **The Power LED glows steadily and the Ready LED blinks.**

3 **The Power and Ready LEDs glow steadily.**

Scanner Technical Specifications

Engine

Scanner Type	Flatbed
Scanning Method	One pass with color CCD
Scan Speed	21 sec/Letter (200 dpi color mode) 32 sec/A4 (300 dpi color mode)
Maximum Reproducible Area	8.11” x 10.61” / Letter, 200 mm x 287 mm / A4, centered on the page (This is the printer’s maximum imageable area.)
Maximum optical resolution	300 x 300 dpi
Noise	Less than or equal to 70dB(A)
Scanner Lamp	Cold cathode
Dimensions	335mm x 53mm x 102mm 13.2” x 20.7” x 4”
Net Weight	7.9 kg, 17.4 lbs

Sample Depth

Color Mode	24-bit/pixel internal (8-bit/color)
Grayscale Mode	8-bit/pixel internal

Data Output

Color Mode	24-bit (hardware) / 24-bit (system)
Grayscale Mode	8-bit (hardware) / 8-bit (system)
Interface	1 25-pin connector and 1 50-pin connector

Power Requirements	
Voltage	100-240 VAC
Frequency	50/60 Hz
Power Consumption	Maximum 52 watts / 2.0 Amps with transparency adapter connected
Power Requirements	Auto-ranging input circuitry suitable for 120 vac and 240 vac. 50/60 Hz

Environmental Ranges	
Operating Temperature	10° to 35° C, 50° to 95° F
Relative Humidity	10% to 85% (non-condensing)

Memory, Resolution, and Average Scan Times

Average Scan Times

These times are based on 8.5” x 11.0” images, with the printer set to 8 bits/color, custom modes, and with 40 MB RAM and an 80 MB hard disk installed.

Magicolor LX

Scanner Resolution (dpi)	Time (sec.)
100	19.8
150	19.6
200	34.9
300	42.7

Magicolor CX

Scanner Resolution (dpi)	Time (sec.)
100	18.6
150	17.52
200	32.51
300	114.08

Average Print Times

Average print time is from the time the job reaches the printer to the time the first copy completely exits the printer. This includes the 55 seconds it takes to print the first page from IDLE. (Subsequent copies are printed at engine speed.)

These times are based on 8.5” x 11.0” images, with the printer set to 8 bits/color, custom modes, and with 40 MB RAM and an 80 MB hard disk installed.

The image type scanned does not affect either scan time or print time. The size of the image scanned, color depth, and scan resolution do affect both scan time and print time, and print resolution does affect print time.

Magicolor LX

Printer Resolution (dpi)	Scanner Resolution (dpi)			
	100	150	200	300
600	202.4 sec	244.1 sec	304.9 sec	435.1 sec
300	137.4 sec	154.6 sec	212.2 sec	353.5 sec

Magicolor CX

Printer Resolution (dpi)	Printer Halftone Selected	Scanner Resolution (dpi)			
		100	150	200	300
600	Enhanced halftone	145.4 sec	188.8 sec	254.0 sec	467.6 sec
600	Colorsmooth halftone	147.3 sec	188.9 sec	250.8 sec	471.1 sec
300	Enhanced halftone	118.4 sec	159.0 sec	223.8 sec	433.7 sec
300	Colorsmooth halftone	117.6 sec	157.7 sec	206.6 sec	449.4 sec

8 bit/color-24/pixel Input Scan Times

These times are based on 40 MB RAM and an 80 MB hard disk at 300 dpi output. Images are processed using available RAM, interleaving to disk if images are larger than RAM.

Magicolor LX

Scanner Resolution (dpi)	Scan Time (sec)	Data Conversion Time-Disk (sec)	First Print Time (sec)	Total Time (sec)
100	19.8	1.8	137.4	159.0
150	19.6	3.6	154.6	177.8
200	34.9	5.2	212.2	252.3
300	42.7	12.5	353.5	408.7

Magicolor CX

Using the Colorsmooth halftone.

Scanner Resolution (dpi)	Scan Time (sec)	Data Conversion Time-Disk (sec)	First Print Time (sec)	Total Time (sec)
100	18.6	16.1	117.6	152.3
150	17.3	34.3	157.7	209.3
200	32.5	60.09	206.6	299.2
300	113	134.9	449.4	697.3

Overall Performance

Using 600 dpi output with 8.5”x11” images.

8bit/color 24/pixel input scan

These times are based on 40 MB RAM and an 80 MB hard disk. Images are processed using available RAM, interleaving to disk if images are larger than RAM.

Magicolor LX

Scanner Resolution (dpi)	Scan Time (sec)	Data Conversion Time-RAM (sec)	First Print Time (sec)	Total Time (sec)
100	19.8	1.9	202.4	224.1
150	19.6	3.45	244.1	267.2
200	34.9	6.7	304.9	346.5
300	42.7	8.1	435.1	485.9

Magicolor CX

Using the Enhanced halftone.

Scanner Resolution (dpi)	Scan Time (sec)	Data Conversion Time-RAM (sec)	First Print Time (sec)	Total Time (sec)
100 DPI	17.3	15.31	145.4	178.0
150 DPI	17.2	34.5	188.8	240.5
200 DPI	32.1	61.0	254.0	347.1
300 DPI	113.0	129.0	467.6	709.6

Disk Drive Support

Larger drives (up to 512 MB) allows larger possible scanned images.

Image Size	Scan Resolution (dpi)	Color Depth (bits/color)	Available Disk Space Required (bytes)
8.5”x11”	150x150	8	6,311,250
8.5”x11”	300x300	8	25,245,000
3”x5”	300x300	8	4,050,000

❖

3

CrownCopy Options

In this Chapter...

- "The ADF Option" on page 2
- "The Transparency Adapter Option" on page 14

The ADF Option

A 50-page ADF (Automatic Document Feeder) can be purchased from your QMS vendor for high-speed document feeding.

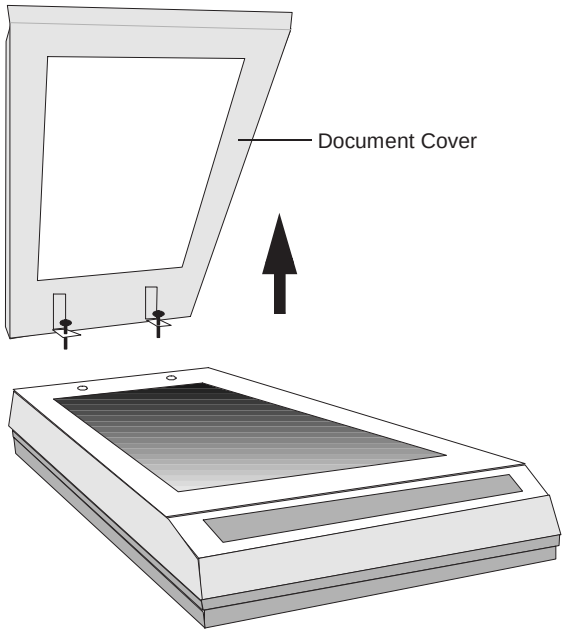
Installing the ADF

1 **Remove all packing material from the ADF.**

Save the packing materials in case you need to ship or store the ADF later.

2 **Turn off the printer and turn off the scanner and unplug it.**

3 **Remove the document cover from the scanner.**

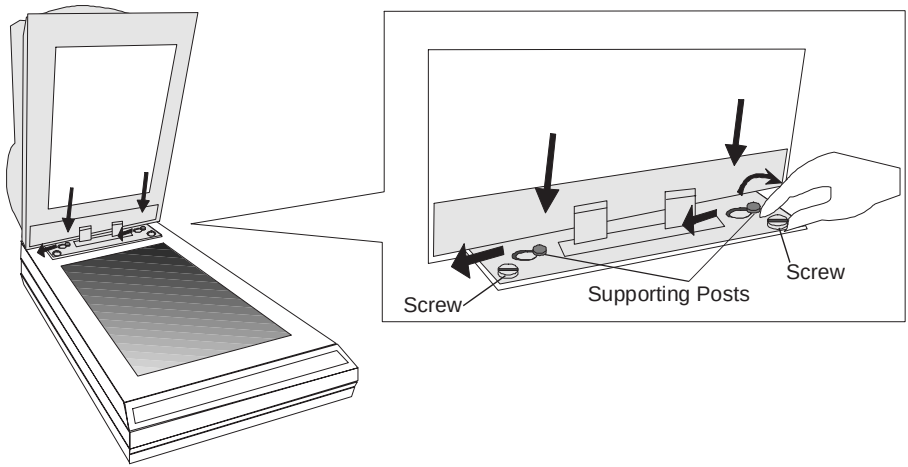


4 Attach the ADF.

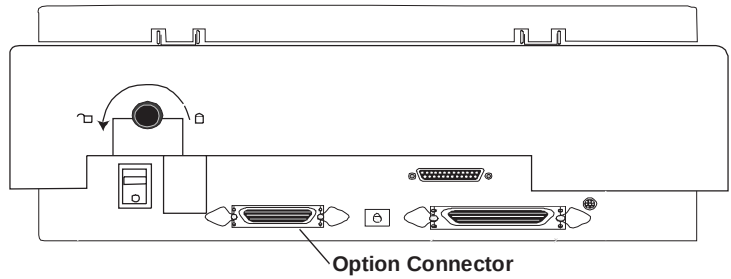
a Lower the ADF onto the scanner, with the two holes on the ADF's hinge plate going onto the scanner's supporting posts.

b Move the ADF so that the scanner's supporting posts slide into the end of narrow side of the holes, then fasten the ADF in place with the two screws. Tighten the screws with your fingers.

▲ **Caution:** *Don't place the screws in the scanner when the ADF is not in place. This could damage the scanner head.*

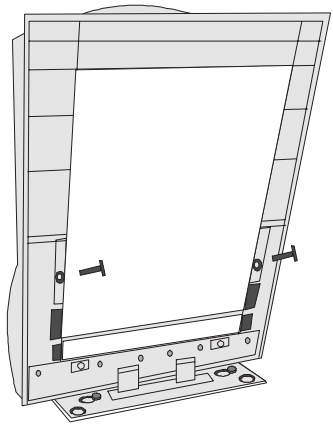


5 Connect the ADF cable to the scanner's option connector.



6 **Plug in the scanner and turn it on, wait 5 seconds, and turn the printer back on.**

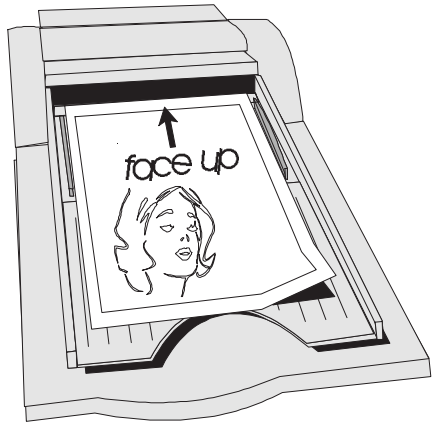
» **Note:** *If you remove the ADF from the scanner, keep the screws mounted on the holes on the back of the ADF for safekeeping.*



Using the ADF

1 **Make sure that no documents are on the scanner glass and that the ADF is closed.**

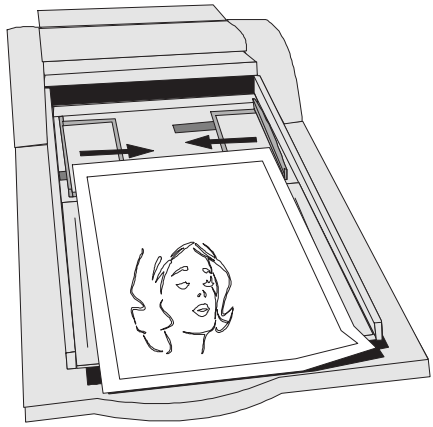
2 **Place documents to be scanned face up in the ADF.**



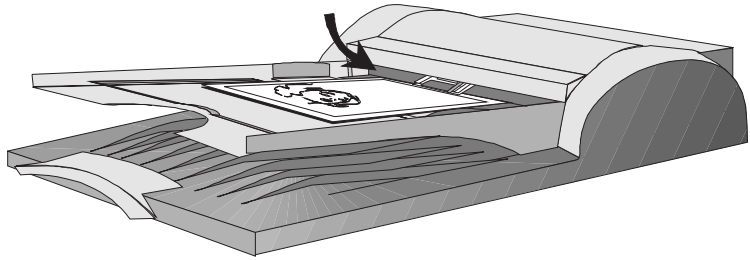
The ADF can be loaded with up to 50 sheets of the following paper sizes:

Size	Inches	Millimeters
Letter	8.50 x 11.00	215.90 x 279.40
A4	8.27 x 11.69	210.00 x 297.00
A5	5.84 x 8.27	148.50 x 210.00
B5	7.16 x 10.11	182.00 x 257.00
Check	2.99 x 5.00	76.00 x 127.00

3 Slide the ADF's paper guides to match the document width.



4 After lining up the document stack, insert the documents in the ADF until you feel them touch the document-stopper.



5 Make your copies.

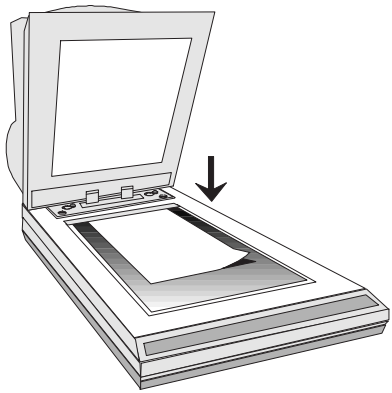
See chapter 2, "Using CrownCopy," for more information.

Loading Documents Manually With the ADF Installed

1 **Remove any documents from the ADF.**

2 **Lift the ADF.**

3 **Place the document to be scanned on the scanner glass.**



4 **Lower the ADF and scan the document.**

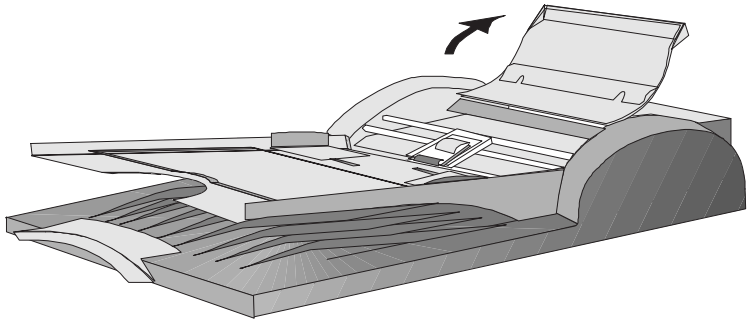
» **Note:** *Don't forget to remove the document from the scanner glass before using the ADF again. Also, there's a slight delay when scanning with the ADF installed because CrownCopy checks for the presence of sheets in the ADF before scanning from the flatbed.*

Troubleshooting the ADF

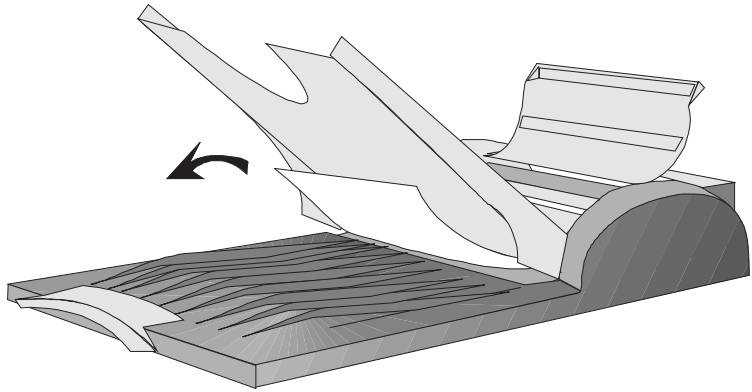
» **Note:** *When troubleshooting problems that occur when the ADF is in place, first check to see if a document has been left on the scanner glass. This can cause jams or unexpected copy output.*

Removing Paper Jams

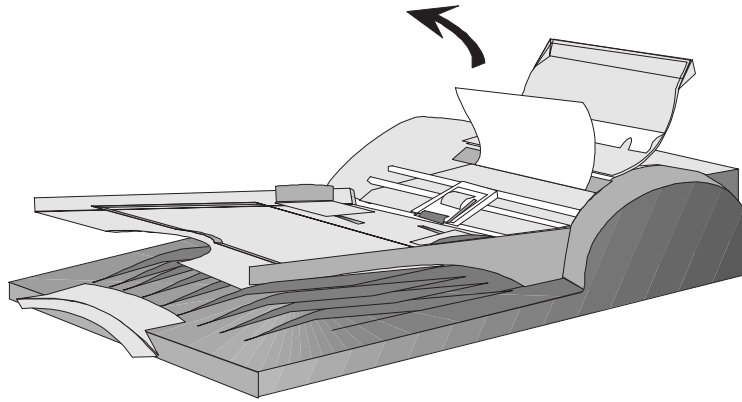
1 Open the ADF cover.



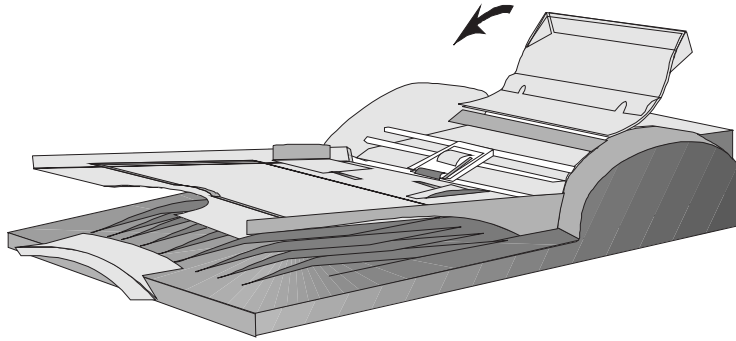
- If the jammed paper is at the ADF exit, lift the upper tray and slowly pull the jammed paper towards you until it is released.



- If the paper is jammed before the ADF exit, slowly pull the jammed paper backward until it is released.



2 After removing the jammed paper, close the ADF cover.

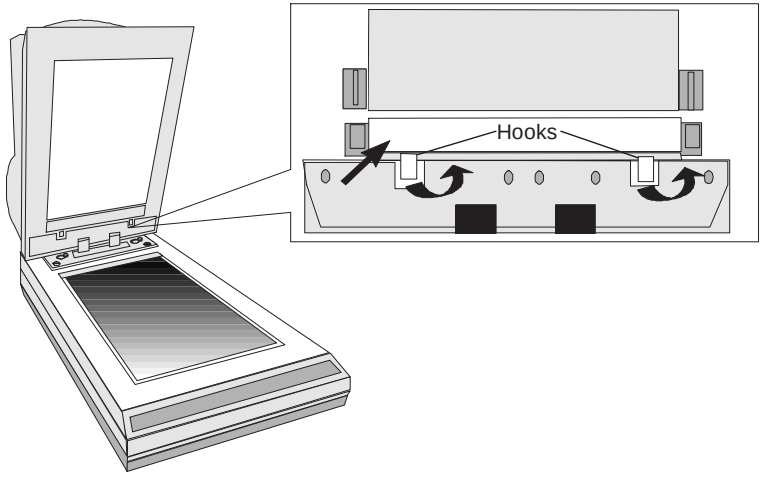


Replacing the ADF Window

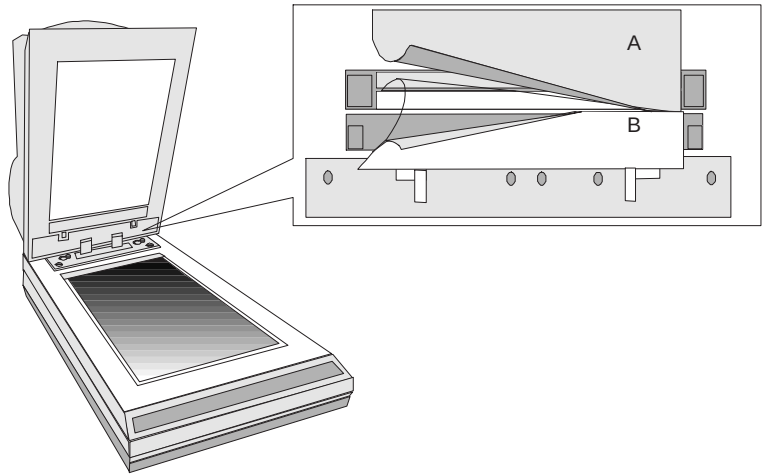
If the quality of your copies becomes reduced by scratches or dirt on the window on the bottom of the ADF, replace it with a new one. Please contact your QMS vendor for information.

1 **Open the ADF cover and lift the ADF.**

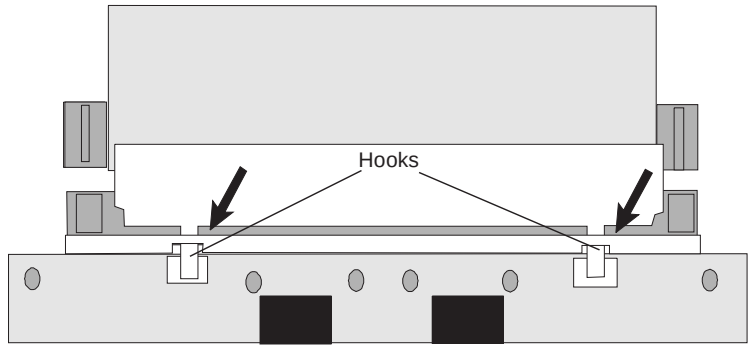
2 **Remove the window from the ADF by pulling the two hooks toward you and pushing the window up.**



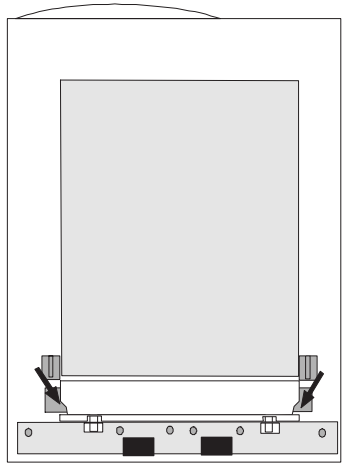
3 Insert the transparent edge of a new window between the ADF's paper guides (A and B), with white sheet on the lower side.



4 Insert the window's two hooks into the ADF.



5 Push down the two protrusions on the window.



6 Close the ADF cover and lower the ADF.

ADF Specifications

Weight	4.5 kg, 9.92 lbs
Dimensions	524mm x 320mm x 104mm 20.63” x 12.59” x 4.09”
Paper capacity	6mm/.23” stack (about 50 pages)
Operation Temperature	5° to 35° C, 41° to 95° F
Operation Humidity	20 to 85%
Storage Temperature	-20° to 60° C, -68° to 140° F
Paper Size	76mm to 216mm, 2.99” to 8.50” (Width) 126mm to 356mm, 4.96” to 14.01” (Length)
Paper Thickness	0.065mm to 0.145mm, .0026” to .0057”
Paper Weight	50 g/m^2 to 127 g/m^2, 13 lbs to 33 lbs.
Paper Quality	Copy paper
Storage Humidity	20 to 85% R.H.
Paper Condition	Should not contain ink that can be transferred to rollers. Do not scan documents with tears, holes, wrinkles, carbon, or adhesives, with paper clips or other fasteners, with folds or curls (more than 6mm).

The Transparency Adapter Option

A transparency adapter, which enhances the copy quality of transparencies, x-ray film, and 35mm slides, can be purchased from your QMS vendor.

Installing the Transparency Adapter

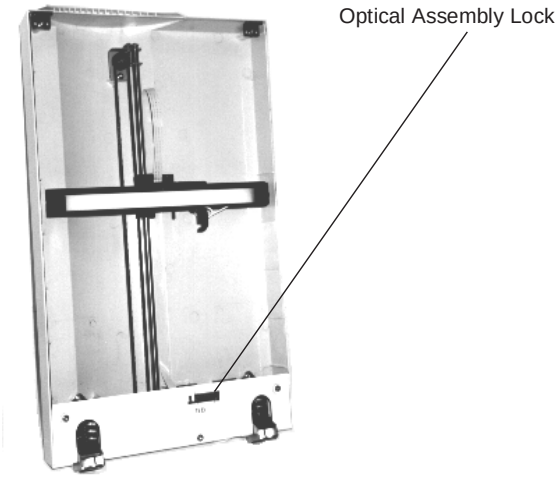
1 Remove all packing material from the adapter.

Save the packing materials in case you need to ship or store the adapter later.

2 Unlock the optical assembly.

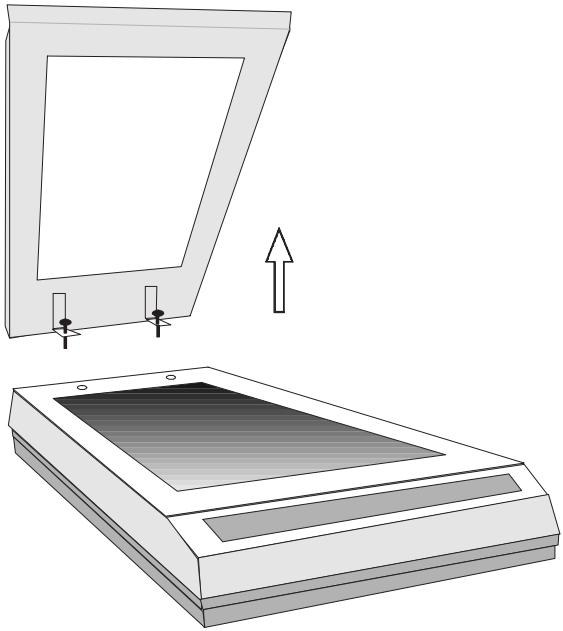
▲ **Caution:** *If you do not unlock the optical assembly, the optical system will be destroyed while scanning.*

Find the optical assembly lock (on the underside of the adapter) and push it to the left until the arrow points to the unlock icon.)



3 Turn off the scanner and unplug it and turn off the printer.

4 Remove the document cover from the scanner.

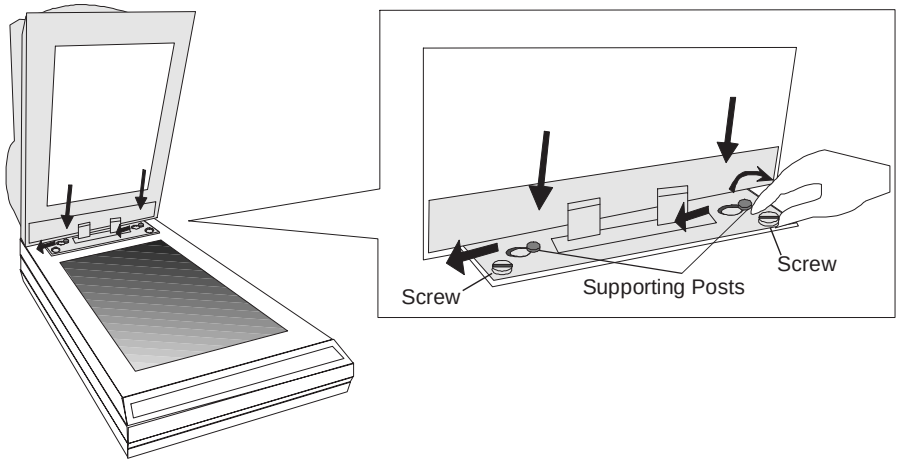


5 Attach the adapter.

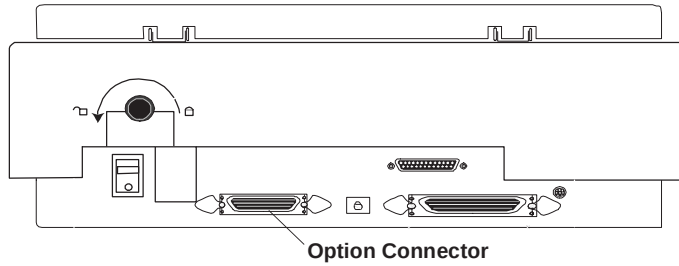
a Lower the adapter onto the scanner, with the two holes on the adapter's hinge plate going onto the scanner's supporting posts.

b Move the adapter so that the scanner's supporting posts slide into the end of narrow side of the holes, then fasten the adapter in place with the two screws. Tighten the screws with your fingers.

▲ **Caution:** *Don't place the screws in the scanner when the ADF is not in place. This could damage the scanner head.*



6 Connect the adapter cable to the scanner's option connector.



7 Plug in the scanner and turn it on, wait 5 seconds, and then turn on the printer.

8 At the printer control panel, enable the Transparency Option in the Copy menu:

a Press the printer's Select/Copy key.

b Press the Next key until Copy Mode appears in the message window, then press the Select key.

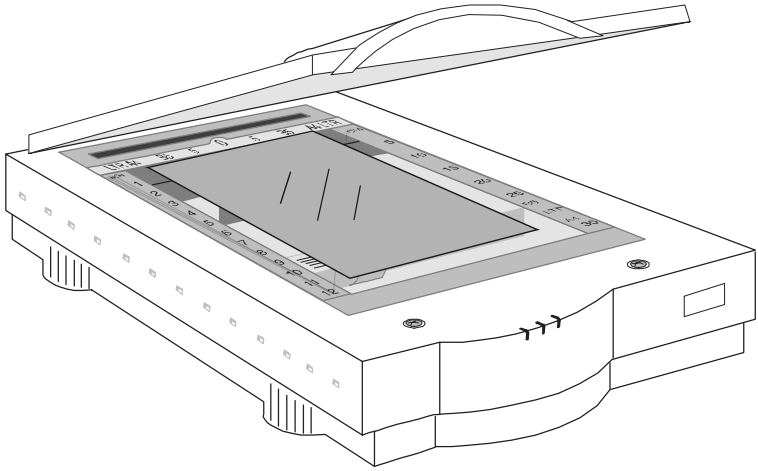
c Press the Next key until Transparency Opt appears in the message window, then press the Select key.

d Press the Next key until Enabled appears in the message window, then press the Select key.

e Press the Online/Offline key to exit the menu.

Using the Transparency Adapter

1 **Raise the transparency adapter and place the transparency on the scanner glass.**



2 **Lower the transparency adapter.**

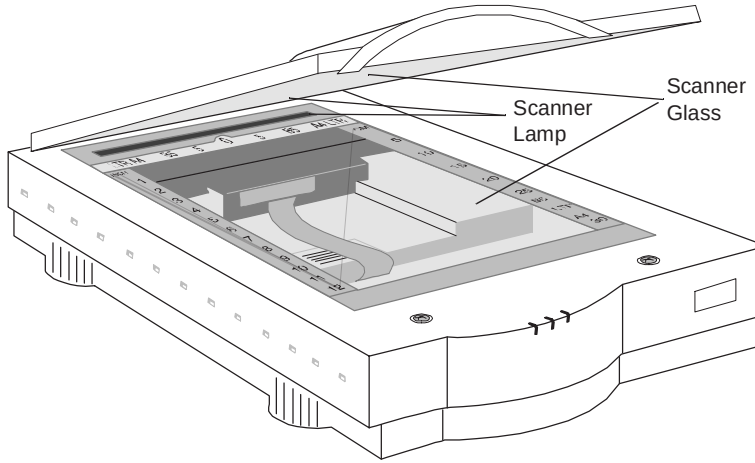
3 **Make your copies.**

See chapter 2, “Using CrownCopy,” for more information.

Transparency Adapter Maintenance

Tips for Optimizing Copy Quality

- Clean the scanner glass (top and bottom) regularly to ensure the best image quality. Before you clean the glass, make sure the scanner is turned off and unplugged.
- Make sure that nothing covers the scanner lamps. It is important to keep the calibration area clean since dust or smudge marks on the glass will reduce the quality of scanned transparencies.



Relocking the Optical Assembly

If you ever have to transport the transparency adapter over a significant distance, be sure to relock the optical assembly:

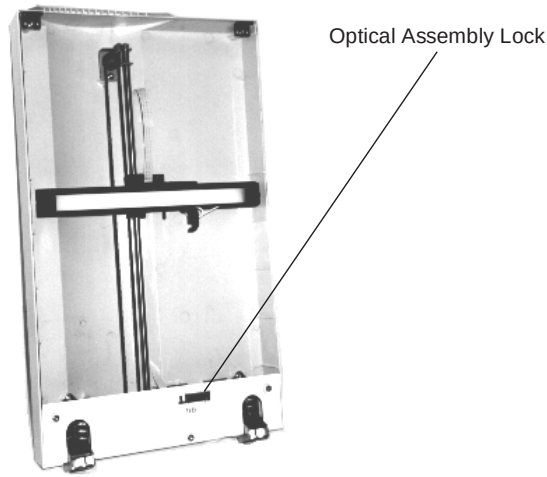
1 **Turn off the scanner.**

2 **Turn on the scanner.**

3 **When the scanner's Ready, Power and Option (UTA/ADF) indicators to light up, turn the scanner's power off.**

The optical assembly should now be in the home position.

4 **Find the optical assembly lock (on the underside of the adapter) and push it to the right until the arrow points to the lock icon.**



Transparency Adapter Specifications

Scan Area	216mm x 297mm, 8.5” x 11.7”
Operation Temperature	10° to 40° C, 50° to 104° F
Storage Temperature	-10° to 60° C, 14° to 140° F
Relative Humidity	20% to 80%
Weight	2.7 kg, 5.95 lbs
Size	523mm x 308mm x 56mm, 20.59” x 12.12” x 2.20”

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4

Copy Quality

In this Chapter...

- “About Print Density” on page 2
- “Adjusting Contrast and Brightness” on page 5
- “Square—shows the quality of squares. The black square shows feathering when there is a toner density problem.” on page 5
- “Improving Copy Quality” on page 7

Introduction

This chapter describes how to improve scanned image quality, and how to adjust print density, contrast, and brightness.

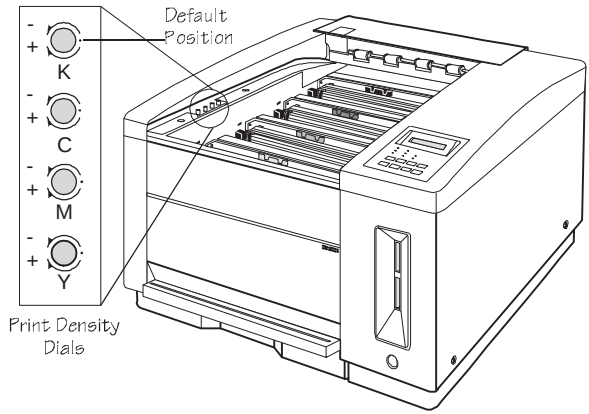
About Print Density

Print density is the amount of toner placed on the page, making the print appear lighter or darker. Normally, your laser printer produces a rich black or color image. However, if the image colors do not look right, or if the colors are printing too light or too dark, then you may need to adjust the print density for that color.

1 Access the Administration/Special Pages menu and print The Color Balance Adjustment Page.

2 Remove the top cover of the printer by lifting it up and out.

3 Locate and check the print density adjustment dials inside and to the front left.



a If they're in the default middle position, then continue at step 4. Otherwise, set them to the default middle position as described in the next step.

b Turn each density adjustment dial either clockwise or counterclockwise, depending on its current setting, until it is in the default middle position.

4 Check the Color Balance Adjustment page for smears or feathering at the top of the bars and squares.

See “About the Color Balance Adjustment Page” on page 4, and reference numbers 1 and 2 on that page to locate the bars and squares.

5 If you find smears or feathering, then turn the black print density adjustment dial (marked K on the printer) slightly to the left (towards the minus sign). Otherwise, continue at the next step.

6 Check the Color Balance Adjustment Page for a close color match between the Target square (square marked Target) and the center swatch inside the Target square.

» **Note:** See step 1 on page 5 and reference number 6 on page 4 to locate the Target square.

a If the colors match stop here.

b If the colors don’t match, go to the next step.

7 Find the center swatch in either the 90° or 45° column, to the left of the Target square, that is most neutral or gray in color.

See “Square—shows the quality of squares. The black square shows feathering when there is a toner density problem.” on page 5, and reference numbers 3 and 4 to locate the swatch.

8 Turn the print density adjustment dial, represented by the swatch, the amount (90° or 45°) and direction (- or +) indicated relative to its current position.

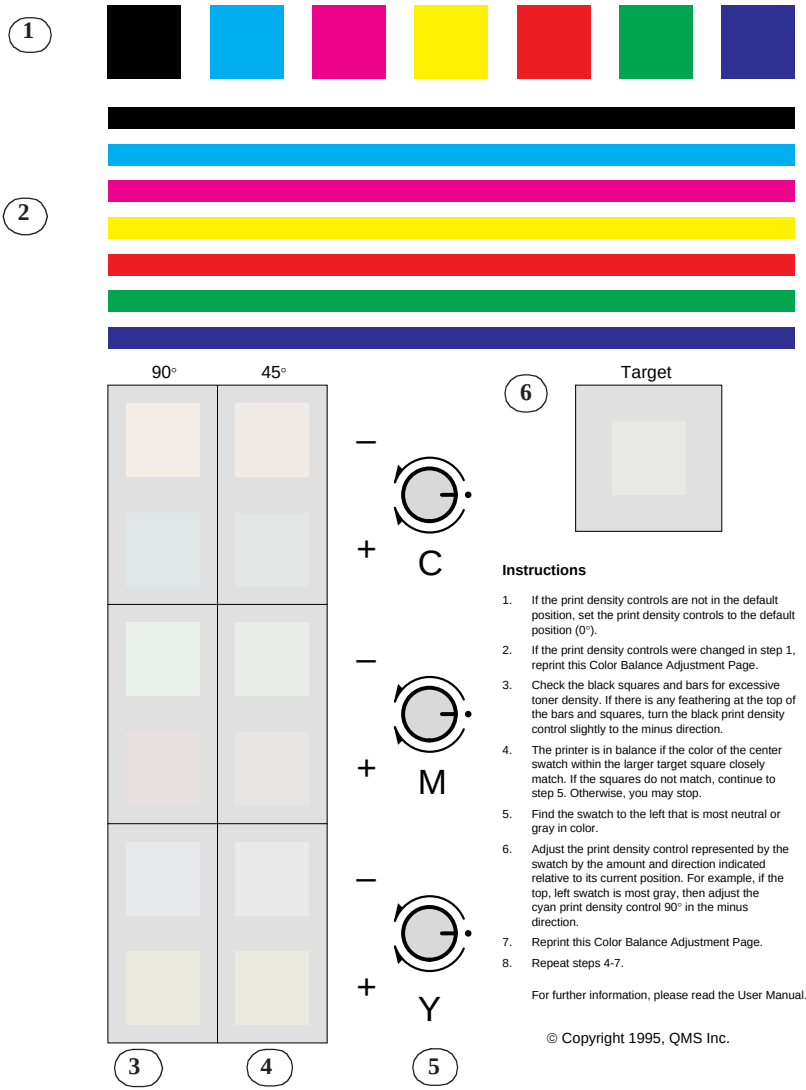
For example, if the CYAN print density adjustment dial (marked C on the printer) is set to 90° in the + direction and the top-left swatch is most gray, then you should turn that dial 90° in the minus direction (at about the default middle position).

9 Reprint the Color Balance Adjustment Page.

10 Repeat steps 6 through 9 until the printer is in balance.

About the Color Balance Adjustment Page

Color Balance Adjustment Page



Instructions

1. If the print density controls are not in the default position, set the print density controls to the default position (0°).
2. If the print density controls were changed in step 1, reprint this Color Balance Adjustment Page.
3. Check the black squares and bars for excessive toner density. If there is any feathering at the top of the bars and squares, turn the black print density control slightly to the minus direction.
4. The printer is in balance if the color of the center swatch within the larger target square closely match. If the squares do not match, continue to step 5. Otherwise, you may stop.
5. Find the swatch to the left that is most neutral or gray in color.
6. Adjust the print density control represented by the swatch by the amount and direction indicated relative to its current position. For example, if the top, left swatch is most gray, then adjust the cyan print density control 90° in the minus direction.
7. Reprint this Color Balance Adjustment Page.
8. Repeat steps 4-7.

For further information, please read the User Manual.

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1 **Square—shows the quality of squares. The black square shows feathering when there is a toner density problem.**

2 **Bar—shows the quality of bars. The black bar shows feathering when there is a toner density problem.**

3 **90° Swatch Column—shows the color matching swatches that will cause a 90° change in the print density adjustment dial.**

4 **45° Swatch Column—shows the color matching swatches that will cause a 45° degree change in the print density adjustment dial.**

5 **Print Density Adjustment Dials—shows the cyan, magenta, and yellow print density adjustment dials. The + and - indicators (in each swatch row) indicate the direction to rotate the print density adjustment dial for that row of swatches.**

6 **Target Square—indicates that the printer is in balance when the colors for both the square and the swatch match.**

Adjusting Contrast and Brightness

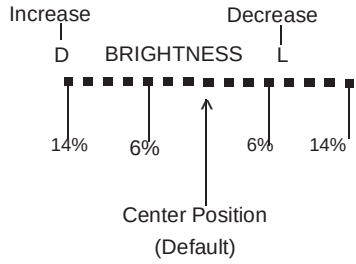
Often in scanned images, colors may be too light or dark to show details clearly. Use the contrast and brightness adjustments in the Copier menu to improve the quality of the scanned image. See chapter 2, “The CrownCopy Menu” section, for more information on these options.

Brightness

Brightness is the perceived quality of radiance or luminosity of a visual object. Increasing brightness (moving the setting in the L direction) makes light and dark areas in the image appear lighter.

Decreasing brightness (moving the setting in the D direction) makes light and dark areas in the image appear darker. See chapter 2, “Using CrownCopy,” for more information.

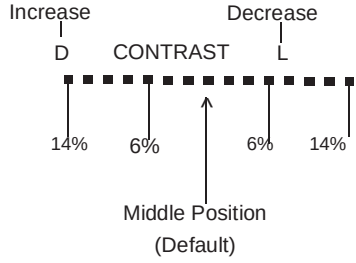
» **Note:** *Each increment of change in the brightness setting is significant in output quality. Therefore, QMS recommends that you change the setting by only one level, print out a test copy, and then determine if further modification to the contrast setting is necessary.*



Contrast

Increasing contrast (moving the setting in the D direction) makes light areas appear lighter and dark areas appear darker. Decreasing contrast (moving the setting in the L direction) makes light areas appear darker and dark areas appear lighter. See chapter 2, “Using CrownCopy,” for more information.

» **Note:** *Each increment of change in the contrast setting is significant in output quality. Therefore, QMS recommends that you change the setting by only one level, print out a test copy, and then determine if further modification to the contrast setting is necessary.*



Improving Copy Quality

The following most frequently asked questions about ways to improve the scanned image quality should help you get the best possible scanned output from CrownCopy:

1 What printer Configuration menu settings can I change to improve the scanned image quality?

All the following Configuration menu settings have an effect on the scanned image quality.

a Administration/PostScript/Default Halftone menu

Color Smooth—Blends colors. It's is good for printed images in general, and especially for removing moíre patterns.

Enhanced—Creates sharper images. It should be used for text and continuous tone images.

» **Note:** *See the magicolor CX/LX user documentation for more information on this menu option.*

b Copier/Copy Mode/Custom/Custom Config/Scan Resolution

A higher resolution slows the copy process, but creates a high-quality image. The Copier/Copy Mode/Select Mode Automatic Color and Automatic Gray options provide a 200 dpi scan resolution. For higher resolutions you must select the Copier/Copy Mode/Select Mode/Custom option and then use this menu to increase the resolution. See chapter 2, "CrownCopy Settings," of this manual for more information on these options.

c Copier/Brightness menu

This option brightens a dark image or darkens a light image. See chapter 2, "CrownCopy Settings," of this manual for more information on this option.

d Copier/Contrast menu

This option can either increase or decrease the difference between the light and dark areas of an image. See chapter 2, “CrownCopy Settings” of this manual for more information on this option.

e Copier/Color Balance menu

Use this setting when a printed image seems to have an undesirable coloring effect in a shaded area. See chapter 2, “CrownCopy Settings,” of this manual for more information on this option.

f Administration/Engine/Def Resolution menu

Check that the default resolution for the printer is 600 dpi when using CrownCopy. See you *magicolor* CX/LX printer documentation for information on RAM requirements for different resolutions, page sizes, and numbers of colors.

2 What other settings on the printer have an effect on the scanned image quality?

a Print Density

See “About Print Density” on page 2 for details on how to adjust the print density. Be careful and check the print density adjustments frequently, especially after the first 300 prints to make sure the density settings are stable.

b Printer Maintenance

Remember a printer in good repair prints better quality images. So it’s important to replace the OPC belt and to keep the internal parts of the printer clean. See your printer documentation for instructions.

c Paper Quality

Images copy better on paper that is specifically recommended for your printer. See your printer documentation for information on the recommended print media types and weights.

3 What is the first thing I should do if the image colors do not look right?

Use the Color Balance Adjustment Page to adjust the print density. See “About Print Density” on page 2 for details on how to adjust the print density.

4 I used the Color Balance Adjustment Page to adjust the printer color, but the scanned image color is still not right.

Usually the default settings balance the printer. However, you might have to make minor adjustments to color balance, brightness, and contrast to improve image quality. When adjusting the brightness and contrast, remember to compare the original image against each copy in the same well lit area. Lay the images side by side so you can make a direct comparison.

After you think the brightness and darkness are right, check to see if there is too much color. For example, if the image has too much green, access Copier/Color Balance and move the arrow towards magenta (move it one level at a time). Then scan the image and look at the colors.

» **Note:** *Keep in mind that the lower the resolution, the less time it takes to copy the image. So scan the image at 100 dpi to save time. Then once you’re satisfied with the colors, increase the resolution to 200 dpi for a higher quality scan.*

5 Why do I have little square boxes and lines in the scanned image when they aren’t in the original?

These are mostly moíre patterns. They’re caused by halftones in the original image. Take a small magnifying glass and look at the original (it appears as a collection of small dots). The scanner reads the dots and the printer tries to recreate the dot image. This produces the resultant moíre patterns.

6 How do I get rid of these little square boxes and lines in the scanned image?

You can try scanning at different resolutions and also try using the Administration/PostScript/Default Halftone/Color Smooth option.

If you're not satisfied with the image quality, try using a higher quality original.

7 Can you tell me why a 100 dpi scan resolution takes the same amount of time as a 200 dpi scan resolution?

Make sure you set the Copier/Copy Mode/Select Mode menu to Custom before changing the scan resolution. Otherwise, you can't use the control panel settings for scan resolution.

8 I've set the number of copies in the Copier/Number of Copies menu to 3, but I still get only 1 copy.

After you set the number of copies, use the Previous key to return to the Copier/Copy menu, and press the Select key twice to save the selected number of copies. Unless the number of copies is saved before you exit from the Copier/Number of Copies menu, it will be automatically reset to 1.

9 Do I have to scan and print an entire page, if I want to scan an image only the size of a business card?

No, you need to do the following:

a Place the image in the upper-left corner of the document glass (as viewed from the front of the scanner with the glass open)

b Access the Copier/Copy Mode/Scan Size menu.

c Set the Horiz (in. x 100) to about 350 and the Vert. (in. x 100) to about 200.

The scanner will now only scan the top-left side of the glass for a width of about the size of a business card.

» **Note:** *The scan width translates into inches times 100, so if you want to scan the top 3.5 inches of a document, then set the vertical size to 350.*

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QMS Customer Support

In this Appendix...

- "Where to Get Additional Help and Information" on page 2
- "QMS World-wide Offices" on page 4

Where to Get Additional Help and Information

Your QMS Vendor

Your local vendor (the one from whom you bought the printer or the CrownCopy kit) may be best equipped to help you. Your vendor has specially trained service technicians available to answer questions, and the equipment to analyze your printer problems.

Q-FAX

Q-FAX, a QMS information retrieval service, provides application notes, technical support notes on common printing problems, and information about printer specifications, options, accessories, consumables, and prices.

In the United States and Canada, call (800) 633-7213 to reach Q-FAX. In all other countries, call (334) 633-3850. Have your fax number handy when you call (or place the call from your fax machine's handset).

You can choose to have either a directory (a list of currently available documents) or a specific document sent to you. The first time you call, request the directory (press 2 on your phone or fax keypad when prompted). Then call back to request specific documents. You can order up to three documents per call.

The QMS Corporate Bulletin Board

The QMS Corporate Bulletin Board System (BBS) contains technical support notes, application notes, drivers, patches, and utilities, and you may leave technical questions not requiring an immediate response on electronic mail for the Sysop (System Operator).

The bulletin board [(334) 633-3632] operates at 1200, 2400, 9600, and 14400 baud, 8 data bits, no parity, 1 stop bit, with XMODEM, YMODEM, and ZMODEM capabilities. Contact QMS Customer Technical Assurance for more information about the bulletin board.

CompuServe

Through CompuServe, you ask general (non-technical) questions, share information with other users, and access printing information and programs. When you use CompuServe, type `go qmsprint↵` to go directly to the forum where QMS is located. The QMS library section contains application notes, printer drivers, utilities, technical information, and announcement files.

Internet

The QMS server provides access to technical reports, new product announcements, a trade show schedule, and other general information about QMS.

If you have access to the World Wide Web, you can view the QMS home page at http://www.qms.com/. The QMS ftp resource is ftp.qms.com.

QMS Customer Response Center (CRC)

The QMS Customer Response Center is available M-F, 7:00 am-6:00 pm, Central Standard Time, at **(334) 633-4500 (US)**. You can also fax questions to the CRC at **(334) 633-3716 (US)**. Please indicate whether you would like a fax or a phone call.

If you call for assistance, have the following information ready so our technicians can help you more quickly:

- Your phone number, fax number, and shipping address
- A description of the problem
- The printer model, serial number, and firmware version (listed on the status and start-up pages

QMS World-wide Offices

QMS United States and Latin America

General Contact
1 (334) 633-4300
Fax 1 (334) 633-4866
Email info@qms.com

Customer Response Center (CRC)
Technical Assistance
1 (334) 633-4500 7:00 am–6:00 pm Central Time
Bulletin Board Service
1 (334) 633-3632

Latin America Fax
1 (334) 639-3347

National Service
Service Information, Installation, and Maintenance Pricing
1 (800) 762-8894
On-Site Service and Depot Repair Information
1 (800) 858-1597 7:00 am–7:00 pm Central Time
Spare Parts Ordering and Information
1 (334) 633-4300 x2530 8:00 am–5:00 pm Central Time

QMS Canada

General Contact
1 (514) 333-5940 or 1 (800) 361-3392
Fax 1 (514) 333-5949

National Service
On-Site Service and Depot Repair Information
1 (800) 268-4969 8:30 am–7:00 pm Eastern Time
Spare Parts Ordering and Information
1 (800) 673-8060 8:30 am–5:00 pm Eastern Time

Bulletin Board Service
1 (905) 673-8215

QMS in Japan

Service Information and Maintenance
81-3 3437 4030
Fax 81-3 3437 4067

QMS in Europe, Middle East, Africa, India, Australia, and New Zealand

Austrailia	**Anitech** (61) 27491244 Fax (61) 35623880
Belgium	**QMS Service Center** (32) 52352377 Fax (32) 52352376
Denmark	**Berendsen Innovation A/S** (45) 39577300 Fax (45) 3957730
Egypt	**United Systems** (202) 3350157 Fax (202) 3609787
Finland	**Qtronic** (358) 06926099 Fax (358) 0674886
France	**Natis** (33) 148637575 Fax (33) 148637444
Germany	**DSI** (49) 21156040 Fax (49) 2115604278 **Printec** (49) 61827780 Fax (49) 618277882
Greece	**Micro-Tec** (30) 18835115-7 Fax (30) 18835118
Iceland	**Aco HF** (354) 627333 Fax (354) 5628622

India	**Rolta India Limited** (91) 228327708 Fax (91) 228365992
Ireland	**Gericmar** (353) 16261666 Fax (353) 16260131
Israel	**M.A.G. Group** (972) 35600650 Fax (972) 35601327
Italy	**Sipac** (39) 258013366 Fax (39) 258012029
Kuwait	**Computers & Com. Concepts Co.** (965) 4725053 Fax (965) 4768062
Luxemburg	**QMS Service Center** (32) 52352377 Fax (32) 52352376
The Netherlands	**QMS Europe BV** (31) 302414646 Fax (31) 302414592
New Zealand	**U-Bix** (64) 93566145 Fax (64) 93566001
Norway	**Berendsen Data** (47) 22676700 Fax (47) 22680420
Poland	**KP System** (48) 22315379 Fax (48) 22783601
Portugal	**CSQ** (351) 13645066 Fax (351) 13643484

Russia	**DPI** (70) 952642853 Fax (70) 952642946
Saudi Arabia	**Nasco** (966) 14771307 Fax (966) 14774913
South Africa	**Nashua Limited** (27) 113134000 Fax (27) 118054139
Spain	**Gemática** (34) 35807534 Fax (34) 35807659
Sultanate of Oman	**Electronics Co. LLC** (968) 790191 Fax (968) 790192
Sweden	**Nexor Repair Center AB** (46) 86293200 Fax (46) 86293221
Switzerland	**A Messerli AG** (41) 18291111 Fax (41) 18291348
United Kingdom	**CRC Ltd** (44) 1844261900 Fax (44) 1844261677
United Arab Emirates	**Luminous Path** (971) 4525211 Fax (971) 2393234

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